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ART. VII. — 1. *The Vine-Dressers' Manual, an Illustrated Treatise on Vineyards and Wine-Making.* By CHARLES REEMELIN, of Ohio. New York: A. O. Moore. 1859. pp. viii., 103.

2. *Bright's Single Stem, Dwarf, and Renewal System of Grape Culture, etc.* By WILLIAM BRIGHT, Philadelphia. New York: C. M. Saxton, Barker, & Co. 1861. pp. iv., 155.
3. *Open Air Grape Culture. A Practical Treatise on the Garden and Vineyard Culture of the Vine, and the Manufacture of Domestic Wine, etc.* By JOHN PHIN. New York: C. M. Saxton. 1862. pp. xvi., 376.
4. *The Grape Culturist. A Treatise on the Cultivation of the Native Grape.* By ANDREW S. FULLER, Brooklyn, N. Y. New York: Printed for the Author, by Davies and Kent. 1864. pp. iv., 259.
5. *Manual of the Vine.* By C. W. GRANT, Iona, N. Y. 1864. pp. 100.

No branch of horticulture has attracted greater attention among us of late years than vine-growing; and the culture of grapes, both for wine making and for sale in the market, is becoming, even in New England, an important branch of popular labor. We propose, therefore, in the following pages, to give a brief account of the extent and prospects of grape culture in this country, and of the origin, character, and comparative value of those kinds of grapes which can be raised in the open air in the Northeastern States.

The vine is a hardy plant, and will grow so far north that it can do no more than blossom. The climate most congenial to it lies between the thirty-fifth and fiftieth degrees of latitude, and between these parallels are the most esteemed plantations and the countries most abounding in wine. Königsberg, in latitude 54° 42′ N., is the extreme northern limit of the vine in Europe; and as we go farther south, we find it increasing in vigor of growth and excellence of fruit. It is indigenous in America, and flourishes from the Rocky Mountains to the Atlantic Ocean, and from Maine to Florida. Many of the early travellers make especial mention of the number of vines they met with in America, of the luxuriance of their growth, and the excellence of the grapes for wine-making.

The earliest attempt to establish a vineyard in the North American Colonies was made by the London Company in Virginia before 1620, although wine had been made from native grapes by the settlers in Florida as early as 1564. In 1630 the Virginia planters imported some French *vignerons*, who ruined the vines by their unskilful management. Wine was made in the Colony in 1647, and premiums were offered for its manufacture in 1651. In the "Perfect Description of Virginia," first printed in 1649, and reprinted as the seventh number in the second volume of Force's "Historical Tracts," we find the following statements: "Vines in abundance and variety do grow naturally over all the land, but by the birds and beasts [are] most devoured before they come to perfection and ripenesse; but this testifies that the Ground and the Climate is most proper, and the Commodity of Wine is not a contemptible merchandize; but some men of worth and estate must give in these things examples to the inferior inhabitants and ordinary sort of men, to show them the gain and Commodity by it, which they will not believe but by experience before their faces." In 1648, Beauchamp Plantagenet, in his "Description of the Province of New Albion," speaking of the various kinds of grapes there growing, said: "The first is the Tholouse Muscat, sweet scented; the second, the great fox and thick grape, after five months reaped, being boyled and salted, and well fined, is a strong red Xeres; the third, a light claret; the fourth, a white grape, creeps on the land, maketh a pure, gold-colored wine. Tennis Pale, the French man, of these four made eight sorts of excellent wine; and of the Muscat, acute boyled, that the second draught will fox [intoxicate] a reasonable pate, four moneths old; and here may be gathered and made two hundred tun in the vintage moneth, and replanted will mend."

In 1683, William Penn made an unsuccessful attempt to establish a vineyard near Philadelphia. Andrew Doré, in 1685, met with no better success. In Beverly's History of Virginia, written before 1722, we are told that there were vineyards in that Colony that produced seven hundred and fifty gallons a year, although little care was bestowed upon the vines, and no pains was taken to improve them. In 1793, Peter Legaux obtained of the Legislature of Pennsylvania the incorporation of a company for cultivating the vine. For one year only were his prospects favorable: quarrels arose, the stockholders sold out, and the vineyard went to ruin.

Many other unsuccessful attempts at wine-making were made in various States, but the great turning-point of vine culture in America was the introduction of the Catawba grape to the public, in 1816. This grape was found growing wild in 1801 in North Carolina, and afterwards made its appearance in Georgetown, D. C., where it was first brought prominently into notice by Major Adlum, who, in introducing it, asserted that he had thus conferred a greater boon upon the people of this country than he would have done if he had paid off the national debt. The name of the late Nicholas Longworth, of Cincinnati, is inseparably connected with the history of this grape, and with the history of wine-making in general in this country. After numerous vexatious and expensive attempts to naturalize European vines in Ohio, he abandoned them altogether, and planted the Catawba, which, though now suffering from the rot, and sure to be superseded by the Delaware, is grown more extensively than any other grape this side of the Rocky Mountains. From Cincinnati it has spread along both banks of the Ohio into Kentucky and Tennessee, and farther westward into Missouri, where it is raised on a large scale.

Nearly one third of all the wine produced in the United States is made in the Ohio valley. In 1850 the number of gallons of wine manufactured in Ohio was 48,207; in 1860, 562,640.

The European grape was introduced into California in 1769 or 1770, from San Carlos in Catalonia, by Spanish Jesuits, and its cultivation has long been an object of the greatest interest and importance to the people of that State, although it is only within a very few years that wine has been made there on a sufficiently large scale to become widely known and appreciated. In 1857 there were not a million cultivated vines in all California. Now at least ten and a half millions are flourishing in her vineyards, while one and a half millions are added to this number every year. The State imported fourteen hundred varieties of foreign vines in 1861 for experimental purposes, and we read of vineyards owned by private individuals which contain from one hundred and sixty thousand to three hundred thousand vines. In 1850, California produced 58,000 gallons of wine; in 1862, 700,000. This new State is sure to become one of the most considerable wine-producing regions in the world; but we do not stop to discuss her prospects or the character of her wines, as we propose to treat almost exclusively of the cultivation of grapes for the table and the market.

The European grape, *Vitis vinifera*, differs widely from the American species, and comprises a vast number of varieties. Which one of these represents the original stock is of course unknown, although the parentage and history of many of the varieties can be ascertained with some degree of certainty. The American family of vines embraces two genera, — the *Vitis* proper, the *Ampelopsis*, and the sub-genus *Cissus*. The vine proper includes four species, viz. *Labrusca*, *æstivalis*, *cordifolia*, and *vulpina*. The *Labrusca*, the most common of the four in New England, has given rise to the Isabella and many other cultivated kinds, while from the *vulpina*, or Southern Muscadine grape, have come the Scuppernong and probably the Catawba. The *cordifolia* is a well-marked variety, with small acerb berries which do not ripen until after a frost (hence its popular name of frost grape), and is represented among cultivated kinds by the Clinton, sometimes found in our gardens. Vines of the species *Labrusca* and *vulpina* are distinguished by the muskiness of their fruit, and all four species are noted for the coarseness and vigor of their growth. All American grapes are diœcious-polygamous, a fact of much importance, as we shall see, in the artificial production of new varieties. Repeated trials have shown the folly of attempting to naturalize the *Vitis vinifera* in New England. It will not succeed except under glass.

No richness of soil or care in training and pruning will ever change the nature of an ordinary vine from the woods. This fact is ignored by many a simple man, who digs up a vine in the woods, transplants it into his garden, and gives it every advantage of soil and situation, in hopes of redeeming its will nature, and making it bear palatable fruit. His labor is lost. The vine remains what it always was. It may not drop its berries so badly, but the character of its fruit is the same as before. A thick, tough skin, enclosing a sour, stringy centre, in which are four or five monstrous seeds: these are the marks of most of our wild grapes; and even when they are a little better than this, they are best described by the words used by Dr. Bigelow in speaking of another plant, —"Fruit mawkish, eaten by pigs and boys." Yet from grapes no better than these have descended the handsome Concord, the luscious Diana, the delicate Rebecca, the Catawba, and last, but not least, the Delaware, *facile princeps* of American grapes.

It is worth while to consider for a moment the steps by which so wonderful a change can be effected.

There are two methods by which we may obtain new.and improved grapes, and each of these has its enthusiastic advocates and professors. First, the method of Van Mons. This plan (successfully applied by Van Mons to the production of new varieties of pears) consists in planting a great number of seeds from the best grapes, and selecting from the plants thus produced those which are marked by some favorable traits, and which show an evident superiority to the parent vine. Seeds from these seedlings are then planted, and the process continued until, by a rich soil and high cultivation, the native habit is entirely broken up. Every deviation for the better from the character of the original vine is eagerly seized upon by the cultivator, who strives to make this deviation permanent. The grapes or seeds are planted in the fall, and the plants which come up are carefully removed from the seed-bed the next autumn, to make room for a second set from the same sowing, which in its turn is succeeded by a third, and even a fourth crop, the value of the plants, by a curious and little understood law, being in direct proportion to the length of time the seeds remain in the ground without germinating. These seedling vines bear fruit in the third or fourth year, but their character is not fully established for several years after. This method has led to brilliant results in the hands of E. W. Bull of Concord and Dr. Grant of Iona Island.

Mr. Bull, twenty years ago, determined to obtain a vine which should blossom late enough to escape the frosts of spring, should ripen its fruit early enough to avoid those of autumn, and at the same time should bear better grapes than any native vine. In this he has had perfect success. He planted seed of the best wild grape he could get, and from this, in the third generation, obtained the grape so well known as the Concord; and from the Concord, to use his own words, he has obtained "grapes as delicate as the Chasselas, and of exquisite flavor."

But a large part of the seedlings raised in this way are barren; and of the fruit-bearing vines nine tenths are rejected, either for marked defects, or on account of having no especially desirable qualities. Thus it will be seen that large numbers of vines have to be raised and sacrificed to obtain one really good one. The Concord vine was, if we recollect right, the best of three thousand seedlings. The new Iona of Dr. Grant is said to be the best of five thousand plants, two thousand of which were rejected in the second year for positive defects. And these seedlings were themselves far removed from the native vine; for the Iona was raised from seed of the Diana, which is descended from the Catawba, and this last comes from a native grape. This method of Van Mons thus requires time and patience, as well as skill in selecting the best and most promising plants.

The second method, by hybridization, consists in impregnating the pistil of the flower of a native grape with pollen from the stamens of a foreign variety, or *vice versa*, and raising seedling plants from the seed thus produced. The advocates of hybridizing claim for their system more speedy and better results than those obtained by the disciples of Van Mons, and the idea of being able to create a vine that shall have the strength, vigor, and hardiness of a native, and whose fruit shall be as delicate as that of the Black Hamburgh or Chasselas, is certainly very fascinating. But those who follow the other method say that in planting wild seed and breeding in and in, so to speak, we have a better foundation to build on; that our native grapes have a much more strongly marked flavor than foreign kinds, and that this flavor, properly softened and refined by successive generations of seedlings, will surpass the simply sweet and luscious taste of European varieties.

Hybridizing has led to very successful results in at least two cases. Messrs. E. S. Rogers and W. Fiske Allen, of Salem, have produced some very remarkable hybrids. The vine known as Allen's Hybrid was obtained by crossing the Isabella with a Chasselas, and is a most beautiful grape. When well sheltered it will sometimes ripen in the open air in New England, and then is the best light-colored grape we have. From its European parent, however, it has inherited an unlucky predisposition to mildew. Mr. Rogers has given to the world no less than forty new grapes, of different degrees of excellence; hybrids between several foreign kinds, and a monstrous and uneatable variety of the *Vitis Labrusca*, from the Salem woods. Some of the new-comers have already taken their place in the small list of standard out-door varieties, and three or four of them, for healthy growth and excellence of flavor, are almost unsurpassed. Some writers, indeed, maintain that they are not genuine hybrids, but simply seedlings of the native grape; but this notion is wholly untenable, and those plants which have come under our immediate notice bear unmistakable marks of their foreign origin.

A glance at the following considerations will show in part the weight of the evidence that goes to prove them to be true hybrids. If forty seeds of the wild grape be planted, and as many seedlings obtained, one half of these seedlings will probably be barren; and of the other half, nine tenths will show no marked superiority to their parent. If forty fertile plants should be raised, all better than the parent vine, it would be little short of a miracle. Now Mr. Rogers has raised forty-four vines without getting one sterile or staminate plant, and the poorest among them is better than the average of fertile seedlings from the wild grape, — a result to be explained only by admitting a large infusion of the *Vitis vinifera* in their composition. Hybrids from two species which are very difficult to cross are generally very sterile; but these are not only true hybrids, they are also very fertile; and we have observed, in some experiments that we are making further to unfold their character, that the seed from these hybrids, and especially from the No. 19, germinates readily, and with much more certainty than seed from the wild grape. The fact of their hybridism being admitted, the experimenter's triumph becomes more brilliant, for distinguished botanists have repeatedly denied the possibility of crossing two distinct species of the genus *Vitis.* Some of these new vines have been crossed a second time with the foreign grape with perfect success, and with very interesting results.

It is a curious but admitted fact, that there are certain plants, as for instance some species of Lobelia, which can be far more easily fertilized by the pollen of another and distinct species than by their own pollen. Decisive experiments upon this point with regard to the genus *Vitis* are still wanting; but whether this singular law holds good with regard to the vine or not, it is certain that the probability that many seedlings raised by the method of Van Mons are hybrids has not yet been sufficiently considered by experimenters. When vines of various kinds are raised in the same garden, it is inevitable that currents of air and those industrious fertilizers, the bees, should carry pollen from one blossom to another, and a cross or mongrel be the result. Any one, says Darwin, can convince himself of the efficiency of insect agency by examining the flowers of sterile Rhododendrons, which produce no pollen, for he will find on their stigmas plenty of pollen from other plants.

Admitting, then, that many seedlings may be unintentional crosses, the immense divergence from the parent stock which some of them manifest will not be surprising.

The striking success that has attended the experiments of the pioneers in hybridizing opens to us a most interesting and profitable field for research. We hardly as yet understand what unhoped for results have been attained, or comprehend the importance of Mr. Rogers's praiseworthy undertaking.

Scarcely any useful plant can be propagated so easily as the vine. It is raised from single buds, called eyes by the nurseryman, from cuttings, by layers, and, for special purposes, from seed. This is a very important trait in the character of the grape, especially to the propagator of new varieties; for if he originates a new and valuable grape, in three or four years he may count his plants by tens of thousands. Raising vines from single eyes is an operation requiring the aid of artificial heat, and a good deal of skill and experience. Millions of vines, however, are so produced every year, and when well grown are undoubtedly the best for planting on a large scale.

The roots in vines thus propagated are in the best possible form for transplanting, as they all radiate from a common centre, and the plant partakes more of the habit of one raised in the natural way, from seed.

A cutting is simply a branch of a vine, with two or three buds. Set in rich earth in spring or fall, under favorable conditions, the top bud sends up a stem, and the lower buds put forth roots, making a strong plant by October.

Layers, as their name indicates, are branches of an old vine bent down into the soil, and made to grow there, while yet deriving nourishment from the parent plant. In this manner the best vines are obtained, but they are expensive, as only a few can be taken at once, and the old vine is much injured.

An excellent method of growing layers, borrowed from the French *vignerons*, has come into use in this country within a few years. It consists in bending down the branches of the vine into large boxes or baskets filled with rich earth, and making them root there. When they have filled the box with roots they are cut loose from the main vine, and thus a well-grown plant is obtained, already potted, which may be transplanted or removed to any distance without disturbing the roots in the least. Vines so raised will bear a few bunches the first year, and thus enable the impatient buyer to test his purchase at once.

No plant will flourish better in unfavorable circumstances than the grape-vine, and at the same time no plant more gratefully repays all that is done for it. It requires for its successful cultivation a southern or southeastern aspect, a dry, rich, and thoroughly pulverized soil, and careful and judicious training.

First, with respect to the soil. It is absolutely necessary that this should be either naturally dry, or else thoroughly drained. Vine-dressers have a saying that "the vine cannot bear wet feet," and this is perfectly true. Stagnant water round the roots of a vine causes the fibres to die prematurely, and this gives rise to weak and ill-ripened wood, sour and worthless grapes. Many soils which are called dry need draining if they are heavy or clayey, not only to carry off water, but to aerate the earth ; for if the soil be such as to be pervious to air, it will be likely to transmit moisture rapidly, and not hold too much of it. A dry soil having been secured by natural or artificial means, the depth to which it should be worked becomes the next, and a very important and perplexing consideration.

Until within a year or two it has been almost heresy to doubt that, the deeper the ground is worked, the better off the vines are, and almost all books on the cultivation of the grape advocate deep trenching; not simply subsoil ploughing, but the actual inversion and pulverization of the soil to the depth of two, three, or even four feet. Some very light volcanic soils are said to have been trenched with profit to the depth of five feet. The Western grape-growers, many of them Germans, who carry out here the same plans which they followed at home, with hardly an exception trench their vineyards two or three feet deep. All the books named at the head of this paper, except Mr. Bright's, recommend deep trenching, and their authors carry out in practice the plans which they advocate in theory. Some cultivators, however, have begun to think that, although working the ground to the enormous depths above mentioned may be very proper in light and porous soils, yet it is unwise to adopt this system in New England ; and Mr. Bright goes even to the opposite extreme. Mr. Bull says: "The soil of Massachusetts does not get heated, during our short summers, sufficiently for the healthy growth of the grape, to a depth greater than about one foot. Now if the ground is trenched and made rich, the roots are coaxed down into the lower and cold stratum of soil, and the wood and buds are not properly ripened, the former being immature and spongy, and as a natural consequence the latter being weak and imperfect, so that next year's crop is enfeebled, and will ripen later. The grape-grower should always aim to get thoroughly-ripened wood. Without this he cannot count on a crop of fruit with any certainty, even if the immature wood survive the winter."

Whether the soil be trenched or ploughed, the finer that part of it is made in which the roots of the young vine will have to make their way, the better it is for the plants. Mr. Bright advises twelve ploughings and as many harrowings, so as to produce the most perfect and minute division of the soil that is possible ; or to use his own words, so that it shall be left at last "as fine as bolted flour." Very few will follow his advice, but those who do will be repaid for their labor.

If the soil of the vineyard be poor, it will of course need enriching. We hardly dare to touch upon the subject of fertilizers, for upon no other topic connected with agriculture have so many disputes and quarrels arisen as upon the question what manures are proper for the grape. One successful grower puts a quarter of an ox under each of his vines, and has splendid crops; another thinks that a good old pasture soil, where no trees, grain, or vines have grown for twenty years, is the best of all soils for the vine; — and between these two extremes is a wide field for theory and practice. A few maxims, however, may be laid down, which probably will be undisputed by all acquainted with the needs of the grape-vine in New England.

Dead cattle, oily woollen rags and waste, and in general all rank, undecomposed manures, are positively injurious. We speak especially of oily rags, because the injudicious application of a quantity of these to the soil came near in one case to destroying a lot of seedling vines, whose worth, regarded as the result of long and tedious experiments, was not to be reckoned in money. Ashes and bone-dust ploughed into the soil, and whole bones buried under the vines, are all excellent. Guano in moderate quantity, and meadow mud composted with ashes, lime, and barn-yard manure, are profitable fertilizers. The notion of having special manures for particular plants is falling into deserved contempt; but we observe that Mr. Bright still advocates a nostrum for the vine. His reasoning is, that because tartrate of potash exists in grapes, *ergo* tartrate of potash, or free tartaric acid, is a proper fertilizer for grape-vines; and he professes to have obtained marvellous results with it. Nothing could be more absurd than this theory. It is not possible that that which plants never find in the soil can be a proper manure for them. Now tartaric acid is never found in the soil, either free or combined, and cannot be found there by reason of the way in which it is produced. Grapes select from the carbonic acid of the air and the water of the soil atoms of carbon, hydrogen, and oxygen, in such proportions as to form tartaric acid, which, uniting with the potash that the vines find in the soil and take up therefrom, forms bitartrate of potash, or cream of tartar. Tartaric acid being an organic acid, and not a mineral constituent of the soil, is of course never found in the earth, and the berries of a vine watered with a solution of cream of tartar would not contain a hundredth of one per cent more of that salt than they would if supplied with potash alone, and left to elaborate their own acid. To water a vine with tartaric acid would be as sensible as to pour molasses round the roots of a sugar-maple, or to water with a solution of quinine the tree that produces that alkaloid. Mr. Bright's success is due solely to the potash in his compost, and not to the acid.

Whoever is about to set out vines, and will plough and pulverize the soil to the depth of eighteen inches, and then make it rich enough to bear a hundred bushels of corn on the acre, need not fear disappointment with the ordinary kinds of grapes, provided always that the land be well drained.

Vines are set out either in the spring or fall. We have tried both seasons, and are inclined to give the preference to the fall. In the vineyard, vines are either trained upon wire trellises or tied up to stakes, and from five hundred to five thousand plants are set out on an acre, the distance between the plants varying from thirty inches to nine feet. For strong, coarse vines, like the Concord, the latter distance is not too great. Plants one year old, if raised from single eyes, or two years old with well-pruned roots, if raised from cuttings, are the best for vineyard culture. Their roots should not be put more than four or five inches below the surface in New England, and on account of our fiery summers the ground should be well mulched with straw, leaves, or tan.

But before planting a vineyard the kind of vines to be planted must be decided upon; and here we have no great latitude of choice, for the number of really good vines that will ripen so far north as Boston is very small. Our climate is not particularly favorable to the vine, the late spring frosts sometimes killing the blossoms, and those of early autumn ruining the fruit. Nothing has done more in past years to bring discredit upon viticulture in New England than planting varieties of grapes that will never ripen here until our summers have an additional month. The Concord, the Hartford Prolific, the Diana, Rebecca, Delaware, possibly Dr. Grant's two new varieties, Allen's Hybrid, and some of Mr. Rogers's new vines, are the only good grapes that can be planted in New England with the full assurance of getting a crop every year. Even this statement has to be limited and qualified, for the Hartford Prolific is not a grape of the first class, the Rebecca is very tender, and the hybrids have not yet been fully tested, or at least have not been in bearing long enough for their failings to become fully apparent. This list is so short that we are justified in speaking of these varieties in detail.

The Hartford Prolific is a strong, coarse vine, a seedling of the native, we believe, in the first generation, and possesses many of those traits which render the native grape so unpleasant. It bears large bunches of round black berries, somewhat tough in the centre, and of a coarse flavor. It would not be tolerated in the garden, were it not for its extreme earliness.

The Concord is a seedling in the third generation from the native. It is extremely hardy, produces enormous crops every year, will grow in soils where better grapes would utterly fail, and, though not a grape of the first quality, is the most profitable market variety, bearing the same relation to other outdoor grapes that Hovey's seedling strawberry does to other strawberries. This variety is planted very extensively, and has done a good work in educating the public taste to something better than the nauseous wild kinds. Whoever cultivates the Concord will have grapes in abundance, though not the best.

The Diana, a much better grape than the last mentioned, is a somewhat tender vine, and a shy bearer when young: it is a seedling of the Catawba, and the parent of the new Iona. It originated in Milton, and came into notice in 1844. In quality the fruit of well-established vines is superior to that of the Catawba, being juicy, rich, and refreshing, with a slight musky odor. Those who plant this must prepare themselves to lay down their vines in the fall, and cover them with three or four inches of earth.

The Rebecca, presumed to be a seedling of the Isabella, is a delicate vine, requiring a favorable location and the highest cultivation; and even with these it sometimes drops its leaves and baffles the cultivator. But when it does succeed, it amply repays all the pains spent upon it. The berries are light yellowish-green, tinged with amber, translucent, and are sometimes sold to unsuspecting purchasers for foreign grapes. A few vines should be planted in every garden, in a warm place, where they can be well sheltered. What has been said of the Rebecca applies with equal force to Allen's Hybrid, a vine or two of which may be planted in some very favorable place, for when it does ripen it is our best white grape.

The Israella, a seedling of the Isabella, is asserted to be the earliest good grape, and the Iona the best grape in every respect, the Delaware alone excepted, that can be raised outdoors. These grapes have been before the public only a few years, and it remains to be seen how they will succeed in New England. A most bitter warfare is now going on about them in the agricultural newspapers, and while every amateur will of course test them, the public will wait till the dust of the battle has subsided, and the true merits of the vines become known.

Of Mr. Rogers's vines we have already spoken, and will only add that his numbers three, four, fifteen, and nineteen deserve to be planted in every garden. They show evident marks both of foreign and native parentage, and for vigor of growth, and size and beauty of berry, come close upon the Black Hamburgh.

Last and best comes the Delaware. This famous grape, unequalled as yet by any other out-door kind, and matched only by the most delicious foreign varieties, has been discussed, condemned, and praised more than any species recorded in the stormy annals of vine culture. Prejudice and hostility have yielded at last, and the Delaware stands now, where it belongs by right, at the head of the list of out-door grapes. Its berries are of a peculiar amber color, and are juicy, delicate, and refreshing in the highest degree. Its growth is slow, but it is as hardy as an oak, and now that under improved cultivation bunches weighing a half-pound have been obtained, the last objection to it, the smallness of its clusters, seems to be removed.

For the vineyard, then, the only kinds which can be trusted at present are the Delaware, the Hartford Prolific, the Concord, and perhaps the Diana. The other kinds should all be planted in gardens, as some of them will give a crop every year. We make no mention of the Catawba or Isabella, as the former cannot be raised here at all, and the latter will not give a full crop once in ten years. This list is so small that it leaves open a wide field for progress and improvement. Whoever will add to our present kinds a new and really good early grape, will not only be a public benefactor, but will reap a rich reward for himself. Whether his grape be very good or not, it will be bought by thousands, if it be a few days earlier than any known kind; for the shortness of our season is the greatest drawback with which the vine-grower has to contend. If we knew any one about to make experiments in hybridizing, we should urge him to cross the Delaware with the Black Hamburgh, and the Concord with the Chasselas. If he should be successful in these two attempts, his success would be brilliant indeed; for it is much to be regretted that Mr. Rogers did not use a better native vine in his experiments.

The limits of our article do not permit us to review the various systems of training and pruning the vine in use in this country and in Europe. Volumes have been written upon this important subject, and much remains to be said; but the whole art depends upon a very simple natural law. The tendency of the sap in the vine is towards the extremities of the branches, and any method of training that leads to profitable results is merely a device by which the cultivator either counteracts this tendency or avails himself of it.

We must content ourselves with a glance at the leading and best system. In this the young plants are allowed to make a single upright shoot or cane the first year, and in the fall this cane is cut back at a point about a foot and a half from the surface of the ground. The next year two horizontal arms are raised from the two uppermost buds of this cane, and from these arms upright fruiting shoots are raised the third year. The vine thus trained has first the shape of the letter T, and then that of a gridiron with the handle stuck in the ground. The canes that have borne fruit are thereafter cut away every autumn, and new ones are raised the next year. The village of Thomery, about five miles from Fontainebleau, where the Chasselas grape is raised for the Paris market, has given its name to a system of training that has been in use there for one hundred and twenty years, and which is perhaps the best method the ingenuity of man and a patient study of the grape-vine have yet devised. Those who wish to become acquainted with this method, which cannot be explained without the aid of diagrams, will find it elaborately treated in Du Breuil's *Cours élémentaire d'Arboriculture*, an excellent translation from which forms an appendix to Mr. Phin's book. The Thomery system requires time for its full development, but it gains ground in this country just as fast as its merits are understood. Around Cincinnati the German vine-dressers train their vines to two or four stakes, clinging to the customs they have brought with them from home; but most American growers train their vines to a permanent trellis of posts and wire.

Delightful as the cultivation of the vine is to the amateur, it will not attract the investment of capital on a large scale, unless it can be shown to be profitable; and even if it can be proved to be remunerative, it will take some little time to make the cultivation universal. Liebig's words, which we find on the title-page of Mr. Bright's book, "Things which bring in money will be sure to make their own way," are very true; but the saying must be taken with some allowance as to the length of time required. Anything new is sure to be ridiculed, and viticulture has both ignorance and prejudice to contend with. It is not easy to convince farmers who are content to travel in the steps of their fathers, and to whom everything beyond the narrow limits of corn and potatoes is rash and foolish speculation, that the stories they read of profits of a thousand and twelve hundred dollars from an acre of land are not wholly apocryphal; yet it can be shown that the cultivation of the vine yields larger and more certain profits than anything else that can be grown out-doors in New England, tobacco alone excepted.

Eight tons of Concord grapes have been raised on an acre in Massachusetts, and six tons is an average crop from vines five or six years old. Mr. Bull says that an acre of vines four years old will give the cultivator fourteen thousand pounds.

A glance at the retail prices of grapes will show whether the market is in any danger of being over-supplied or not. Concord grapes were sold last year in Boston at from twelve to twenty cents per pound, Isabellas at twenty-five cents, Dianas at thirty, and Rebeccas at forty. Delaware grapes have not yet made their appearance in the Boston market in large quantities, but in New York they are sold at prices varying between forty and sixty cents per pound. These prices sufficiently explain the large profits made by grape-growers. At a meeting of the Western Fruit-growers' Society, held in Rochester, in 1859, profits of from one thousand to fifteen hundred dollars per acre were reported, and no cultivator gave in a return of less than five hundred dollars as the result from an acre of grapes.

Those who have been the longest engaged in vine-growing in New England are the most enthusiastic, and we may congratulate ourselves that a new, unfailing, and most profitable branch of agriculture is taking firm root among us. For the amount of capital and care employed, the out-door culture of the grape offers profits which we may look for in vain from other standard crops.

California and Ohio need no longer monopolize the vine. With our present kinds, and with new and improved varieties better suited to our short summers appearing every year, we shall soon be able to rival our sister States. Already American vines are receiving great attention in France and Germany, where they have been introduced with the hope that they will be free from the disease (*oidium*) which has made such havoc in European vineyards. American grapes are regularly exported from New York to the Old World; and if the progress of the next twenty years equals that of the last twenty, we shall have no need of hot-houses; for the distance between the best foreign grapes and our best out-door varieties is only a fraction of that which separates the Fox grape of the woods from the Iona.

With regard to wine, it is sufficient to say, that, although the Concord makes a tolerable wine, and the Delaware a wine that sells for twice the price of the Catawba, yet very little, comparatively speaking, will be made in New England while grapes for the table command the present high prices. As vineyards multiply and prices fall, the surplus fruit will undoubtedly be converted into wine, and such wine too, if we can trust the promises made by some of the best kinds, as will not fear a comparison with famous European sorts. Wine is even now extensively manufactured by at least two firms in Massachusetts, and others in Connecticut, from wild grapes found in the woods, although we have heard of none produced from vineyards planted for the purpose.

We hardly dare to look forward to the time when the vine shall cover all the bleak and barren hills of New England; but we do see close at hand the day when broad vineyards will be planted to supply with their luscious fruit the markets of our cities and great towns, and when rows of well-chosen and well-trained vines will be as common an appendage to every decent garden as a line of currant-bushes is now.

We have endeavored to set forth, more by figures of arithmetic than those of rhetoric, the importance of the cultivation of the grape in the open air in New England, and to furnish our readers with some hints upon this subject drawn in a large measure from our own experience. We would infuse into them a little of our own enthusiasm about hybridizing, the production of new varieties, and, in short, everything that relates to the cultivation and development of this precious plant. It is as true now as it was two hundred years ago, that "some men of worth and estate must give in these things examples to the inferior inhabitants and ordinary sort of men, to show them the gain and commodity by it, which they will not believe but by experience before their faces."

We wish we could say, in persuasive accents, to every one who owns a rod of land,—Plant a good vine, tend it and care for it, and you will have your reward. Do not wait till next year, but

> "Insere *nunc* Meliboee pyros, pone ordine vites."